

What is claimed:

1. A process for inactivating and/or reducing pathogens from tissue having a tissue axis and having a plurality of cavities in which pathogens reside comprising:

dry spin centrifuging the tissue at a given G force having a given direction to remove material from the tissue and/or promote solvent penetration into the tissue; and

at least one further centrifuging step using a solvent fluid to inactivate or reduce pathogens in the tissue;

during the at least one further centrifuging step, orienting the tissue axis to an angle non-parallel to the G force given direction, the G force being greater than 1000 G to thereby penetrate the pathogen reducing solvent fluid into substantially all of the cavities of the tissue where the pathogens reside to inactivate and/or reduce the pathogen content in said cavities

2. The process of claim 1 wherein the solvent fluid is selected from at least one of the group consisting of an alcohol, a detergent, an oxidizer, a solvent and a surfactant.

3. The process of claim 1 comprising centrifuging the tissue in at least a portion of the process in the presence of the solvent fluid at a G force greater than 4000 G.

4. The process of claim 1 including infusing a chemically reactive substance during the at least one further centrifuging step for breaking down lipids and/or proteins.

5. A process for inactivating and/or reducing pathogens in tissue having a plurality of cavities in which the pathogens reside comprising centrifuging the tissue with a pathogen reducing solution in a single wet spin to produce a G force on the material to remove material from the tissue and promote solution penetration into the tissue, the centrifuging penetrating the pathogen reducing solution into substantially all of the cavities of the tissue where the pathogens reside to thereby inactivate and/or reduce the pathogen content in said cavities
6. The process of claim 5 including exposing the tissue to a volume of said reducing solution of greater than 3 liters.
7. The process of claim 5 including exposing the tissue to a volume of said reducing solution of greater than 4 liters.
8. The process of claim 5 including exposing the tissue to a volume of said reducing solution of greater than 5 liters.
9. The process of claim 5 wherein the G force exceeds 2000G.
10. The process of claim 5 including dry centrifuging the tissue after centrifuging the pathogen reducing solution to remove traces of solvents and debris.

11. The process of claim 5 wherein the tissue is at least one of cancellous bone, cortical bone, and connective tissue.
12. The process of claim 5 where the solvent reducing solution is applied to the tissue in one of a batch and continuous flow.
13. The process of claim 5 wherein the solvent reducing solution comprises at least one viral and/or bacterial pathogen inactivating solution to inactivate the pathogens.
14. The process of claim 5 wherein the solvent reducing solution is for inactivating viral and/or bacterial pathogens, the centrifuging for flowing the solvent reducing solution to flush the pathogens from the cavities and inactivate the pathogens in the cavities and then removing the solvent reducing solution carrying the flushed pathogens from the vicinity of the tissue.
15. The process of claim 5 wherein the tissue comprises bone, the pathogens comprise lipids and/or proteins, the solvent reducing solution for removing the lipids and/or proteins from the bone, the process comprising continuously flowing and centrifuging the pathogen reducing solvents and/or surfactants with the bone so that the solvents and/or surfactants continuously infuse into and out of the cavities of the bone to continuously flush the lipids and/or proteins from the bone.

16. The process of claim 5 wherein the tissue comprises bone, the pathogens comprise lipids and/or proteins in the tissue cavities, the process for solublizing the lipids and/or proteins by centrifuging the bone with the pathogen reducing solvent and/or surfactant to cause the pathogen reducing solvent and/or surfactant to flow into substantially all of the cavities of the tissue.

17. The process of claim 5 including infusing biologically and/or mechanically useful substances into the tissue cavities during a centrifuging step.

18. The process of claim 5 wherein the infusing step includes infusing at least one antibiotic for forming a tissue preservative during storage of the tissue.

19. The process of claim 5 wherein the infusing step includes infusing at least one antibiotic forming a tissue preservative during storage of the tissue and at least one tissue growth factor for release from the tissue after implantation of the tissue into an animal.

20. The process of claim 5 wherein the infusing the mechanically useful substance step includes infusing a plasticizer for maintaining tissue pliability after freeze drying or drying.

21. The process of claim 5 wherein the infusing the mechanically useful substance step includes infusing glycerol to maintain the tissue pliability after freeze drying or drying.

22. The process of claim 5 wherein the infusing the mechanically useful substance step includes infusing structurally enhancing materials, which are thermally or chemically set.

23. The process of claim 5 the infusing the mechanically useful substance step includes infusing polymers, which are thermally or chemically set.

24. A process for removing lipids and/or proteins from bone cavities comprising centrifuging the bone with at least one enzyme to infuse the at least one enzyme into substantially all of the cavities to digest the lipids and/or proteins to make them more soluble, and then removing the digested lipids or proteins and at least one enzyme from the cavities.

25. The process of claim 24 including pathogens in the bone wherein the lipids and/or proteins coat the pathogens, the process further including providing a pathogen reducing fluid during the centrifuging for inactivating, reducing and/or removing the pathogens.

26. A process for cleaning animal tissue having cavities and including contaminate material which interferes with penetration of the tissue cavities by fluids, the tissue

defining a longitudinal axis, the process comprising centrifuging the tissue in a batch centrifuge first in a dry state to remove the contaminate material to promote penetration of fluids into the tissue cavities, followed by at least two centrifuging steps each producing a G force in a given direction on the tissue and using at least one solvent to inactivate and/or reduce pathogens in the tissue, the tissue axis being oriented in a given orientation relative to the G force given direction and wherein the G force of each step is at least 1500G.

27. The process of claim 26 where the G force is at least 2000G.

28. The process of claim 26 wherein the tissue is bone, the bone axis being oriented parallel to the G force direction.

29. The process of claim 26 including orienting the tissue axis non-parallel to the G force direction.

30. The process of claim 26 including dry centrifuging the tissue for removing the at least one solvent from the tissue and for removing contaminants separated by the centrifuging from the vicinity of the tissue.

31. The process of claim 26 including infusing biologically and/or mechanically useful substances into the tissue cavities during a centrifuging step.

32. The process of claim 31 wherein the infusing step includes infusing at least one antibiotic for forming a tissue preservative during storage of the tissue.

33. The process of claim 31 wherein the infusing step includes infusing at least one antibiotic forming a tissue preservative during storage of the tissue and at least one tissue growth factor for release from the tissue after implantation of the tissue into an animal.

34. The process of claim 31 wherein the infusing the mechanically useful substance step includes infusing a plasticizer for maintaining tissue pliability after freeze drying or drying.

35. The process of claim 31 wherein the infusing the mechanically useful substance step includes infusing glycerol to maintain the tissue pliability after freeze drying or drying.

36. The process of claim 31 wherein the infusing the mechanically useful substance step includes infusing structurally enhancing materials, which are thermally or chemically set.

37. The process of claim 31 wherein the infusing the mechanically useful substance step includes infusing polymers, which are thermally or chemically set.

38. A process for introduction of at least one growth factor in animal tissue comprising centrifuging the tissue in the presence of a liquid containing the at least one growth factor.

39. The process of claim 31 wherein the infusing the mechanically useful substance includes infusing a polymer, which may be set by solvent removal, extraction or evaporation.

40. A process for providing infusion of any one of cryoprotectants, radiation protectants, plasticizers and liquid polymers into tissue having a tissue axis and having a plurality of cavities comprising:

dry spin centrifuging the tissue at a given G. force having a given direction to remove material from the tissue and/or promote solvent penetration into the tissue; and
at least one further centrifuging step using a solvent fluid to inactivate or reduce pathogens in the tissue;

during the at least one further centrifuging step, orienting the tissue axis to an angle non-parallel to the G force given direction, the G force being greater than 1000 G to thereby penetrate any one of the materials selected from the group consisting of cryoprotectants, radiation protectants, plasticizers and liquid polymers into substantially all of the cavities of the tissue.

41. A process for providing infusion of any one of cryoprotectants, radiation protectants, plasticizers and liquid polymers into tissue having a plurality of cavities comprising

centrifuging the tissue with a solution in a single wet spin to produce a G force on the material to remove material from the tissue and promote solution penetration into the tissue, the centrifuging penetrating any of the materials selected from the group consisting of cryoprotectants, radiation protectants, plasticizers and liquid polymers into substantially all of the cavities of the tissue.

42. A process for providing infusion of any one of cryoprotectants, radiation protectants, plasticizers and liquid polymers into tissue cavities, the tissue defining a longitudinal axis, the process comprising centrifuging the tissue in a batch centrifuge first in a dry state to remove the contaminate material to promote penetration of fluids into the tissue cavities, followed by at least two centrifuging steps each producing a G force in a given direction on the tissue and penetrating the tissue with at least one of the materials selected from the group of cryoprotectants, radiation protectants, plasticizers and liquid polymers into the tissue, the tissue axis being oriented in a given orientation relative to the G force given direction and wherein the G force of each step is at least 1500 G.
43. A tissue made by any of the processes of claims 1, 5, 24, 26, 38, 40, 41 and 42.